

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Withdrawn) A data receiving method for data link layer of a protocol applied to an electric device, which consists of a physical layer, a data link layer, and an upper layer, the method comprising the steps of:

receiving data from the physical layer;

storing the received data in a packet buffer;

deciding whether new data has been received within a predetermined data allowable interval time since last data is received; and

based on a result of the first decision, completing receiving the data;

composing a packet of data stored in the packet buffer; and

transmitting the composed packet to the upper layer.

2. (Withdrawn) The method of claim 1, wherein if, in the decision step, the new data is not received within the data allowable interval time, receiving the data is completed, whereas if the new data is received within the data allowable interval time, the new data is stored in the packet buffer.

3. (Withdrawn) The method of claim 1, further comprising the step of: deciding whether the data link layer is ready for receiving data prior to the data receiving step, and if the data link layer is ready, receiving the data.

4. (Canceled)

5. (Withdrawn) The method of either claim 1 or 3, further comprising the step of:
after the completion of receiving the data and before composing the packet, disabling
the data link layer's data reception.

6. (Withdrawn) The method of claim 5, further comprising the step of:
after a lapse of a predetermined time since the packet transmission, enabling the data
link layer's data reception.

7. (Withdrawn) The method of claim 6, wherein the predetermined time is a
minimum packet permitted time interval (MinPktInterval).

8. (Withdrawn) The method of claim 7, wherein the minimum packet permitted time
interval (MinPktInterval) is greater than a time spent at the upper layer in receiving the packet
and completing packet processing.

9. (Canceled)

10. (Currently Amended) A ~~data transferring~~ method of transmitting data in a network
~~including a network device, the network device including~~~~for data-link layer, wherein the data~~
~~link layer is of a protocol applied to an electric device, which comprises~~ at least a physical layer,
a data link layer and an upper layer, ~~and the data link layer~~ ~~transmitting~~~~transmits~~ a packet from
the upper layer to the physical layer, ~~and the network device connected to other network devices~~
~~in the network through a transmission medium, which the method being performed by the data~~
~~link layer of the network device and comprising~~ ~~comprises~~ the steps of:

~~waiting until a transmission of data through the transmission medium is terminated;~~
~~after the transmission is terminated, a first checking step for checking~~~~sensing~~ whether the
~~transmission medium is idle during a predetermined time interval determined regardless of a~~
~~priority, wherein the priority is assigned to a message packet to be transmitted by the network~~
~~device~~~~network status is in an idle status;~~

if the transmission medium is idle during the predetermined time interval, obtaining a competitive window based on a priority and a retry-count, wherein the retry-count indicates how many times the message packet is tried to be transmitted;

according to a result of the first checking step, selecting a transmission delay time (RandomDelayTime) randomly between a minimum value of the competitive window and a maximum value of the competitive window;

a second checking step for checking whether the network status transmission medium is an idle status during the selected transmission delay time (RandomDelayTime); and

if the transmission medium is idle during the transmission delay time according to a result of the second checking step, transmitting the received message packet to the physical layer, and

if the transmission medium is busy not idle during the transmission delay time, performing an adjusting operation, wherein the adjusting operation comprises incrementing the retry-count, and incrementing the maximum value of the competitive window by a predetermined shifting value.

11. (Cancelled)

12. (Withdrawn) The method of claim 10, further comprising the step of:
making a first decision regarding whether the packet is successfully transmitted.

13. (Cancelled)

14. (Cancelled)

15. (Currently Amended) The method of claim 1210, further comprising the steps of:
determining whether or not the message packet is successfully transmitted;
if, in the first decision step, the message packet is not successfully transmitted, increasing the retry count (RetryCount) for the received packet by a predetermined value;
making a first comparison between comparing the increased retry count (RetryCount) and a predetermined backoff repeat times (BackOffRetries); and
based on a result of the first comparison comparing, transmitting a transmission result to the upper layer.

16. (Currently Amended) The method of claim 15, wherein if, according to the result of comparing in the first comparison step, the increased retry count (RetryCount) is greater than the backoff repeat times (BackOffRetries), the transmission result comprises a failure message (SEND_FAILED) or if, in the first comparison step, the increased retry count (RetryCount) is less or equal to the backoff repeat times (BackOffRetries), performing all steps again starting from the first checking step.

17. (Cancelled)

18. (Currently Amended) The method of claim 10, according to one of claims 10 to 12, 15, and 16, further comprising the step of:

making a second comparison between comparing a transmission execution time of the received message packet and a predetermined maximum transmission allowable time (MACExecTime) before incrementing the retry-count;

wherein if, in the first and second checking step steps, the network status is busy or if, in the first comparison step, the increased retry count (RetryCount) is less or equal to the backoff repeat times (BackOffRetries), the second comparison step is performed.

19. (Currently Amended) The method of claim 18, further comprising the step of:
based on a result of the second comparison comparing, transmitting a transmission result to the upper layer.

20. (Currently Amended) The method of claim 19, wherein if, according to the result of the comparing in the second comparison step, the transmission execution time of the received message packet is greater or equal to the maximum transmission allowable time (MACExecTime), the transmission result comprises a failure message (SEND_FAILED) or if, in the second comparison step, the transmission execution time of the received packet is less than the maximum transmission allowable time (MACExecTime), performing all steps again starting from the first checking step.

21-57. (Cancelled)

58. (New) An apparatus of transmitting data through a network, the apparatus connected to network devices included in the network through a transmission medium, the apparatus comprising:

a physical layer;

an upper layer; and

a data link layer transmitting a packet from the upper layer to the physical layer, wherein the data link is configured to:

wait until a transmission of data through the transmission medium is terminated,

sense, after the transmission is terminated, whether the transmission medium is idle during a predetermined time interval determined regardless of a priority, wherein the priority is assigned to a message packet to be transmitted by the apparatus,

obtain, if the transmission medium is idle during the predetermined time interval, a competitive window based on a priority and a retry-count, wherein the retry-count indicates how many times the message packet is tried to be transmitted,

select a transmission delay time (RandomDelayTime) randomly between a minimum value of the competitive window and a maximum value of the competitive window,

check whether the transmission medium is idle during the selected transmission delay time (RandomDelayTime),

transmit, if the transmission medium is idle during the transmission delay time, the message packet to the physical layer, and

perform, if the transmission medium is not idle during the transmission delay time, an adjusting operation, wherein the adjusting operation comprises incrementing the retry-count, and incrementing the maximum value of the competitive window by a predetermined shifting value.

59. (New) The apparatus of claim 58, wherein the data link layer is further configured to:

determine whether or not the message packet is successfully transmitted,

increment, if the message packet is not successfully transmitted, the retry count (RetryCount) by a predetermined value,

compare the increased retry count (RetryCount) and a predetermined backoff repeat times (BackOffRetries), and

transmit, based on a result of the comparing, a transmission result to the upper layer.

60. (New) The apparatus of claim 59, wherein if, according to the result of comparison, the increased retry count (RetryCount) is greater than the backoff repeat times (BackOffRetries), the transmission result comprises a failure message (SEND_FAILED).

61. (New) The apparatus of claim 58, wherein the data link layer is further configured to compare a transmission execution time of the message packet and a predetermined maximum transmission allowable time (MACExecTime) before incrementing the retry-count.

62. (New) The apparatus of claim 61, wherein the data link layer is further configured to transmit, based on a result of the comparison, a transmission result to the upper layer.

63. (New) The apparatus of claim 62, wherein if, according to the result of the comparison, the transmission execution time of the message packet is greater or equal to the maximum transmission allowable time (MACExecTime), the transmission result comprises a failure message (SEND_FAILED).